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ABSTRACT

Developments in the measurement and theory of creativity are reviewed, and the present status of creativity vis-a-vis psychometrics and theory is explored. The realm of creativity has been a quagmire of definition problems, with creativity variously defined in terms of process or stages. In past eras, creativity was essentially measured by output or productivity. Contemporary measures include the Torrance tests, derived from the structure of intellect model, and various tests such as the Remote Associates Test (Mednick, 1962), the Starkweather Originality Test (1974), the Group Inventory for Finding Creative Talent (1980), the Barron Welsh Art Scale, and a number of rating scales and surveys. The proliferation of tests suggests that it is necessary to review the components of a test before issuing it, looking for an operational definition of creativity and support for test reliability and validity. Minimum requirements include: (1) outside empirical support for the test; (2) long-term follow-up studies; (3) comparison measures against other recognized measures; (4) essential basic agreement in the field as to what "creativity" means; and (5) an adequate theoretical base for research and test construction. (Contains 36 references.) (SLD)

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On the Theory and Measurement of Creativity

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Creativity has been with us for centuries. There have been theories as to what it is, from whence it stems, and it's development. These theories have stemmed from the ridiculous to the sublime. In addition, efforts have begun to be made regarding the psychometric measurement of creativity. This article reviews the past theoretical orientation germaine to creativity and examines some of the endeavors to "measure" this oft elusive construct. Implications for the field are examined and measurement problems are discussed.

Creativity has been around since the first cave man " created" or discovered fire and the wheel. Since then, there has been no stopping " creative man " in his endeavors. We have put a man on the moon, invested televisions, autos, and hand held calculators and computers. However, although there are intelligence tests, aptitude tests, personality measures and achievement batteries, the measurement of creativity seems to have lagged behind in the realm of psychometrics. Furthermore, theoretical postures have often been limited to words i.e. divergent, original, new, different, etc.

This paper will review past developments in the measure and theoretical realm relative to creativity and will examine the present status of creativity vis-a-vis psychometrics and theoretical knowledge and understanding of this construct and further refine our measurement capabilities.

WHAT IS CREATIVITY ?

The entire realm of "creativity " has been a quagmire of definitional problems. A number of definitions have been offered by various theorists. A number of definitions have

been offered by various theorists. Ausubel (1963) describes creativity as " rare and unusual talent in a particular field of endeavor" and goes on to state that " creative achievement...reflects a rare capacity for developing insights, sensitivities and appreciations in a circumscribed content area of intellectual or artisitic activity" (pp 99-100). Hoffman (1963) offered a more comprehensive defintion :

" the creative act can be analyzed into five major components : 1) it is a whole act, a unitary instance of behavior; 2) it germinates in the production of objects of of forms of living which are distinctive; 3) it evolves out of certain mental processes; 4) it co-varies with specific personality transformations and 5) it occurs within a particular kind of environment. A demonstration of the necessary features of each of htese factors can employ both descriptive and logical prcedures; it can refer to the relevance of empirical evidence, and can infer what grounds are logically necessary in order to explain certain facts." (p.18-19)

E. Paul Torrance, perhaps the leading figure in creativity has defined creativity as follows :

" A process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficult; searching for solutions, making guesses or formulating hypotheses about the deficiencies, testing and retesting these hypotheses and possibly modifying and re-testing them, and finally communicating the results." (Torrance, 1966,p.6).

Thus far, we have seen three relatively straight-forward definitions. Other researchers have taken perhaps a more divergent approach or perspective. Four theoretical postures have been advocated by Tryk (1968) and he has ineicated that they should be measured separately i.e. creativity as a product, a capacity or aptitude, a process or an aspect of the total person.

Instead of attempting to define creativity, a number of other researchers have conceptualized it as a set of stages. Wallas (1926) theorized four stages: preparation, incubation, illumination, and verification. Fabun (1958)

added three components to Wallas' scheme. His initial stage was labeled " desire ". This has components of Piagetian disequilibration as typically a problem enhances the desire to find an answer. Keating (1980) has four components with " vaguely temporaral sequences ". His components include : 1) content knowledge 2) divergent thinking 3) critical analysis and communication skills.

In addition, Parnes (1981) outlined five stages : 1) fact finding 2) problem finding 3) idea finding 4) solution finding and 5) acceptance finding.

MEASURING CREATIVITY

In times of old, and during the Rennaissance, creativity was essentially measured by output or productivity. Thus, Leonardo da Vinci and Michelangelo were assessed on the basis of how many paintings and sculptures they " churned out ". A difficulty with the " measurement of creativity " during past times is that a great many artists were not acknowledged until after their demise (Edgar Allen Poe and others).

The best known contemporary measures of creativity are the Torrance tests (Torrance, 1966). There is a verbal component of this test (Thinking Creatively with Words) and a Figural Part (Thinking Creatively withPictures) . These tests yield four scores, but not from all tests. They are, of course, derived from Guilford's structure of the intellect model (1950) and include fluency, flexibility, elaboration and originality, traits which Guilford associated with creativity. In addition, a new form of creativity measurement has been made available, Thinking Creatively with Sounds and Words (Khatena and Torrance, 1973 and Torrance, Khatena and Cunnington, 1973). These tests have been extensively utilized and researched. However, scoring is difficult and training in scoring procedures is hard to procure. There are, howewver, testing centers which do provide scoring for a minimal fee.

Another well known test is the Remote Associates test devised by Mednick (1962). Students are given a list of words and they are required to generate words that they associate with the words in the list.

Scoring is different than the Torrance measures as it emphasizes the differentness or remoteness of the response. Frank Williams'Creativity Assessment Packet (CAP, 1980) is another effort to assess the cognitive and affective factors related to creativity. This test is comprised of a Test of Divergent Thinking and a Test of Divergent Feeling. A third component , a rating scale for parents and teachers is administered separately. The two tests can be group administered to children ages 8 to 18, grades 3 to 12. The test is based on the Williams model and assesses the following cognitive-intellectual modes : fluent thinking, flexible thinking, original thinking and elaborative thinking. In addition, the following affective-feeling domains are examined : risk taking, complexity, curiosity and imagination. Scoring criteria and examples are provided as well as a rationale for each domain in the Divergent Thinking Test. For the Divergent Feeling Test, objective scoring is accomplished by the use of two templates. The manual also provides information regarding reliability (moderate) and validity.

Another creativity measure is the Starkweather Originality Test (1974). However, the age range for this instrument is 3 1/2 to 6 1/2 and this measure is individually administered. Following a practice or warm up session forty plastic foam pieces are utilized and the child indicates what each piece might be. Validity information is principally of a concurrent nature and three types of reliability information are required. Unfortunately, no norms are presented, although up-dated information may be in progress as Starkweather has other creativity tests for young children under development.

A recent endeavor to provide a quick screening device has been the Group Inventory for Finding Creative Talent (GIFT) developed by Rimm and Davis (1976) and Rimm (1980). This measure attempts to identify students whose attitudes and interests are similar to those that are usually associated with creativity. The test is machine scored by the publisher, thus eliminating the scoring difficulties frequently associated with the Torrance Test. The scores for the GIFT are : Imagination, Independence, and Many Interests (thus differing from the Torrance model) and are

presented (for whatever reason) as normal curve equivalent scores.

Still another instrument for assessing creativity is the Barron Welsh Art Scale. This test is actually part of the Welsh Figure Preference Test and contains 86 items from the Revised Art Scale authored by Welsh. All administrative and scoring directions are in the manual for the Welsh Figure Preference Test.

In addition to tests, a number of " rating scales " are available. One such scale is the Kranz Talent Identification Instrument (KTII, Kranz, 1981), an updated version of the Multi-Dimensional Screening Device. As research has shown, teachers seem to be poor at identifying gifted children. The KTII accepts that premise, but posits that they (teachers) can be trained.

The KTII involves three procedures : 1) An in-service training component for teachers with a videotape of the author to familiarize teachers with the rating procedures and the ten talents measured 2) The actual rating and 3) the final decision by a committee based upon rating from other

data i.e. information from a peer nomination form, a parent and a pupil questionnaire.

The ten talents are :

1) Visual arts talents

2) Performing arts talents

3) Creative talents

4) One-sided talent

5) Academic talent

6) Leadership and organizing talent

7) Psychomotor talent

8) Spatial and abstract thinking talent

9) Underachievement talent

10) Hidden Talent

The tape and the manual explain each of the talents and how to recognize them. Three are most interesting. One, " one sided talent ", refers to some long term preoccupation with some topic (Kranz's favorite example is " salamanders"). A second " underachievement talent " refers to underachieving rather than the conscious, deliberate attempt to underachieve and finally, " hidden talent " refers to a

child's ability to cope at school despite adverse home circumstances and difficulties.

For those interested solely in creativity, only talent number three may need to be investigated. However, the use of this ten item scale may also uncover lesser recognized talents and potentials. A tangential scale, again, with a creativity component is the Scale for Rating Behavioral Characteristics of Superior Students (Renzulli and Hartman, 1981, Renzulli, 1983). There are ten " creativity characteristics" and these are assessed on a four point scale. A motivational scale and an intellectual ability scale are also included to enhance evaluation.

There are a number of lesser known tests and attitude surveys used in studying creative behavior/talent. Gary Davis (1971) has reviewed these noncomercially available instruments sans evaluation.

The tests include the Fables Test (Getzels and Jackson, 1962), Hidden Figures (Witkin, Dyk and Paterson, 1962), the Hot Dog Problem (Davis et al, 1969), Independence of Judgment Test (Barron, 1958), Mosaics (Baron, 1958), Sentence Fluency (Taylor, 1947), Similarities (Wallach and

Kogan, 1965), Symbol Equivalence Test (Barron, 1958) and the Tourist Problem (Hyman, 1964).

The surveys reviewed are the Childhood Attitude Inventory for Problem Solving (Covington, 1966), the Empathy Scale (Elms, 1966), Experiences Questionnaire (Taft, 1969), How Do You Think ? (Davis, Houtman, Warren and Roweton, 1969), Pennsylvania Assessment of Creative Tendency (PACT) (Rookey, 1969), Preconscious Activity Scale (Holland and Baird, 1968), Thinking Interest Inventory (Merrifield, unpublished test) and last but not least, What Kind of Person are You ? from E. Paul Torrance (1970) . As the reader can discern, most if not all of the aforementioned tests have not " stood the test of time". Unfortunately, in creativity, as in many other fields, we often have a " bandwagon effect ", leading to a glut of books, articles, and yes, creativity tests which have little or no validity or reliability.

There seems to be a need to review the necessary components of a test prior to it being rushed out onto the market. In addition, some theoretical posture and if possible, some operational definition of the term "

creativity ". At the present time, testing in general appears to be experiencing a resurgence of activity, especially in the intelligence testing realm (Shaughnessy, 1985) More recent tests have early on, 1) defined their construct, and 2) constructed their tests relative ot htat predefiend construct. Thus, the tests are based on a singular theory, rather than constructing a test then explaining it in a ex post facto manner. Further, some tests are inappropriately utilized in terms of what they prport to measure. An interest inventory is not a test of creativity, although it may correlate quite well with some external criteria. Unfortunately, in our " micro-waved world " we have sought out the " quick and easy " means for identification and have left important issues by the wayside. The most important issues include : 1) Outside empirical research by other researchers, 2) long term follow up studies, 3) comparison measures against other recognized measures of creativity, 4) essential basic agreement in the field as to what constitutes " creativity " and finally 5) an adequate theoretical base from which to proceed with one's research and test construction.

Theoretically, there still appears to be perspectives which have not been explored, much less mentioned. Information processing theory has only tangentially been investigated by Glover, Zimmer and Bruning (1980) and by this author, Shaughnessy (1984). Piagetians have not addressed the issue of creativity although Feldman (1981) has also addressed some salient issues.

References

Ausubel, D.P. (1963) The Psychology of Meaningful verbal material . New York : Grune and Stratton.

Barron, F. (1958) Needs for order and disorder as motives in creative activity. The Second research Conferences onm the Identification of Creative Scientific Talent. Ed., C.W. Taylor. Salt Lake City : University of Utah Press

Carroll, J.B. (1941) A factor analysis of verbal abilities. Psychometrica, 6, 279-307

Covington, M.V. (1966) A childhood attitude inventory for problem solving. Journal of Educational Measurement 3, 234.

Davis, G. (1971) Instruments useful in studying creative behavior and Creative Talent. The Journal of Creative Behavior, 5, 162-165

Davis, G. Hooutman, Warren & Roweton (1969) A program for Training Creative Thinking : 1 Preliminary Field Test. Technical Report No. 104, Wisconsin Research and Development Center for Cognitive Learning, University of Wisconsin

Elms, A.C. (1966) Influence of Fantasy ability on attitude change through role playing. Journal of Personality and Social Psychology 4, 36-43

Feldman, D. (1981) Beyond universals in cognitive development Ablex: New Jersey.

Fabun, D. (1968) You and creativity. New York : Macmillan

Getzels and Jackson (1962) Creativity and Intelligence New York : John Wiley and Sons

Glover, J.A. Zimmer,J. & Bruning, R. (1980) Information processing approaches among creative students. The Journal of Psychology 105, 93-97.

Guilford, J.P. (1950) Creativity. American Psychologist, 5, 444-454

Holland & Barid (1968) The preconscious Activity Scale : The development and validation of an originality measure. Journal of Creative Behavior 2, 214-223.

Hyman, R. (1964) Creativity and the Prepared Mind : The Role of Information and Induced Attitudes. Widening Horizons in Creativity, Ed. C.W. Taylor. New York : Wiley, 69-79

Keating, D.P. (1980) Four faces of creativity : The continuing plight of the Intellectually underserved. Gifted Child Quarterly 24, 56-61

Khatena, J. & Torrance, E.P. (1973) Thinking creatively with sounds and words : Norms- Technical Manual (Research Edition) Lexington, Mass: Personnel Press.

Krantz, B. (1981) Kranz Talent Identification Instrument. Moorhead, Minn. Moorhead State College

Mednick, S.A. (1962) The Associative Basis of Creativity. Psychology Review 69, 220-232.

Merrifield, P.R. Unpublished test Thinking Interest Inventory Department of Educational Psychology. New York University.

Parnes, S.J. (1981) The magic of your mind. Buffalo, New York : Creative Education Foundation.

Renzulli, J.S. (1983) Rating the behavioral characteristics of superior students. GCT Sp[et/Oct, 30-35

Renzulli, J.S. & Hartman (1981) Scale for rating the behavioral characteristics of superior students. In W. B. Barbe and J.S. Rensulli (Eds) Psychology and Education of the Gifted (3 rd Ed). New York : Irvington

Rimm, S. & Davis, G.A. (1976) GIFT : An instrument for the identification of creativity. Journal of Creative Behavior 10, 178-182.

Rookey, T.J. (1969) Pennsylvania assessment of creative tendency (PACT) Unpublished test. Department of Public Instruction, Commonwealth of Pennsylvania, Harrisburg, PA

Shaughnessy, M.F. (1985) What's New in I.Q. ? A Contemporary analysis with implications for gifted/talented/creative. The Creative Child and Adult Quarterly 10,2, 72-85.

Shaughnessy, M.F. (1984) What does it mean to be high creative ? Paper presented at the Rocky Mountain Psychological Association April 1984 Las Vegas, Nevada

Taft, R (1969) Peak Experiences and Ego Permissiveness : An Exploratory Factor Study of their dimensions. Acta Psychologica, 29, 25-64.

Taylor, C.W. (1947) A factorial study of fluency in writing. Psychometrica 12, 239-262.

Torrance, E.P. (1966) Torrance Tests of Creative Thinking : Norms- Technical Manual (Research Ed). Lexinton, Mass : Personnel Press

Torrance, E.P. (1970) Creative learning and teaching. New York : Dodd.

Torrance, E.P. Khatena, J. & Cunnington (1973) Thinking creatively with sounds and images : Directions manual and scoring guide, Sounds and images and onomatopeia and images (Research ed.). Lexington, Mass. : Personnel Press.

Tryk, H.E. (1968) Assessment in the study of creativity Advances in psychological assessment, V.I. (Ed., P. Mc Reynolds Palo, Alto, Calif. : Science and Behavior Books

Wallach & Kogan (1965) Modes of thinking in young children : A study of creativity -intelligence distinction. New York : Holt Rinehart and Winston

Wallas, G. (1926) The art of thought London : C.A. Watts

Witkin, Dyk & Paterson (1962) A Psychological differentiation New York : Wiley.